

### **Remarks**

Claims 1, 5, 6, 9-24, 26-30, 32-39, 43, 44, 47-63, 66, 68, 70-74, and 89 are pending in the application. Claims 4, 25, 42, 90 and 91 have been canceled without prejudice. The Applicants expressly reserve the right to prosecute in subsequent divisional applications or continuing applications or both claims covering the subject matter of the claims canceled. 35 U.S.C. §§ 120-121. Claims 27, 28 and 34-37 stand withdrawn as being drawn to a non-elected species. Upon allowance of a generic claim, Applicants will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141.

Claims 1, 6, 10, 11, 14, 15, 16, 18, 19, 20, 23, 24, 26, 30, 32, 33, 39, 48, 49, 51, 54, 55, 57, 58, and 70 have been amended. Support for the claim amendments can be found throughout the application, including the claims as originally filed. Importantly, no new matter has been added to the claims. For example, support for the amendment to claims 1 and 39 can be found on page 14 of the specification and in the Examples. The amendment to the claims should not be construed to be an acquiescence to any of the rejections. The amendments to the claims are being made solely to expedite the prosecution of the above-identified application. The Applicant reserves the right to further prosecute the same or similar claims in subsequent patent applications claiming the benefit of priority to the instant application. 35 USC § 120.

### **Response to Rejections under 35 U.S.C. 112¶2**

Paragraph numbers corresponding to the paragraph numbers in the Examiner's office action have been used for clarity.

6. Claims 51 and 55 stand rejected under 35 U.S.C. 112¶2 based on the Examiner's contention that they are indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Applicants respectfully traverse this rejection.

The Examiner contends that claims 51 and 55 are indefinite because they allow Z to represent "heteroalkylphenyl" and that such a representation broadens the definition of

Z in claim 39, from which claims 51 and 55 depend, instead of further limiting the definition of Z. Claims 51 and 55 as amended do not include the definition “heteroalkylphenyl” for Z. Therefore, the Applicants submit that claims 51 and 55 particularly point out and distinctly claim the subject matter which the Applicants regard as the invention.

Accordingly, the Applicants respectfully request the withdrawal of the rejection of claims 51 and 55 under 35 U.S.C. 112¶2.

**Response to Rejections under 35 U.S.C. 112¶1**

Paragraph numbers corresponding to the paragraph numbers in the Examiner’s office action have been used for clarity.

5. Claims 1, 4-6, 9-26, 29, 30, 32, 33, 38, 39, 42-44, 47-63, 66, 68, 70-74 and 89-91 stand rejected under 35 U.S.C. 112¶1 based on the Examiner’s contention that the specification does not reasonably provide enablement for a system of the scope as claimed in claim 1, and claims dependent thereon, and a coating of the scope as claimed in claim 39, and claims dependent thereon. The Applicants respectfully traverse this rejection.

The Applicants submit that regarding claims 4, 25, 42, 90 and 91, the rejection has been rendered moot by the cancellation of these claims.

Regarding the remaining claims, claims 1 and 39, as amended, include a coating wherein the coating comprises a certain composition. Support for this limitation can be found on page 14 of the specification. The Applicants submit that the claims are enabled by the specification. To further support this contention, the Applicants submit a Declaration in accordance with C.F.R. Rule 1.132 by Professor Randall Alberte who is an inventor on the present application.

The Applicants would like to address the points raised by the Examiner in her final office action dated April 5, 2005.

### “System” and “Biofilm resistant surface”

The Examiner contends that the terms “System” and “Biofilm resistant surface” are overly broad and that claims comprising these terms are not fully enabled by the specification. The Applicants respectfully direct the Examiner’s attention to paragraph 6 and Exhibit 2 of the Declaration which disclose the mechanism by which antifouling coatings of the present invention work. It is apparent from the mechanism that the actual object comprising the biofilm resistant surface is not key to making or using the present invention. Because the fouling organisms never make it past the coated surface, systems of the present invention can comprise a wide variety of coated objects.

In addition, claim 1 as amended comprises a coating which comprises a compound of formula 1. The Applicants respectfully submit that one of ordinary skill in the art would be able to make and use the claimed system as amended because it is the coating and not the actual object being coated that is important.

### “Coatings”

The Examiner also contends that the term “coating” is overly broad and that the scope of claims comprising this term is not fully enabled by the specification. The Examiner points to the definition of coating supplied by the specification which includes gas, vapor, liquid, paste, semi-solid or solid coatings. The Applicants respectfully submit that the amendments to claims 1 and 39 specify the vehicle of the coating and therefore the type of coating as well. For instance, coatings no longer include gas or vapor coatings, and the paste, semi-solid or solid coatings have been further limited by specifying the vehicle.

Additionally, the Applicants direct the Examiner’s attention to paragraph 7 and Exhibits 4-6 of the Declaration where it is stated and shown that the coatings of the present invention can comprise a wide variety of materials. Materials include, for example, silicones (PDMS, block copolymer silicones, GE RTV-11), epoxy, rosin, acrylate, polyesters, mixtures of epoxy, arylates, polyesters, and rosins, plastics (polyethylene, polycarbonate, polypropylene, latex), glass, and hydroxylapatite (tooth enamel). The Applicants respectfully submit that the claims as amended are fully enabled

by the specification because the claims comprise coatings of certain compositions which are further supported by the Declaration.

#### “Anti-fouling”

The Examiner also contends that the data presented in the specification are insufficient to demonstrate any predictability with respect to how each of the numerous compounds encompassed by the general structures defined in the present claims would function in an anti-fouling capacity against any one of thousands of possible organisms such as bacteria, fungi, viruses and/or protists if used in/on any one of the numerous possible diverse surfaces/systems contemplated by the present specification and encompassed by the present claims.

The Applicants wish to repeat that the unique mechanism by which the anti-fouling coatings of the present invention work justifies the scope of the present claims. The coatings prevent fouling agents from adhering to a surface (see Exhibit 2 of the Declaration). Adhering to a surface is the first step by which all fouling agents act upon a surface. If they don't stick to the surface they can't foul the surface. The Applicants direct the Examiner's attention to paragraph 8 and Exhibits 3-4 of the Declaration for a long list of fouling agents that the systems and coatings of the present invention have been tested against. The fouling agents include various species belonging to such organisms as slimes, bacteria, fungi, algae, viruses, and small invertebrates. One can see by the variety of fouling agents listed that by preventing adherence, the coatings and systems are effective against an incredible range of fouling agents. Therefore, the Applicants submit that the scope of the present claims is enabled by the specification and further supported by the Declaration.

#### “Compounds”

The Examiner contends that there are numerous compounds encompassed by the general structures defined in the claims which contribute to the overly broad scope of the claims.

The Applicants respectfully submit that over several correspondences with the Examiner, including the present one, the Applicants have steadily limited the scope of

compounds covered by formula 1 to where Z is only aryl or an alkyl homolog of aryl (i.e. when Z is  $-(CH_2)_mR_{80}$  and  $R_{80}$  is aryl); Y is O or two other elements within the same column as O in the periodic table of the elements; and X is OH or a halide. The Applicants have optionally included substitutions on “Z” in formula 1 with common organic groups to prevent easy design arounds and ensure the scope of coverage that they are entitled to.

The Applicants also respectfully submit that the specification includes examples where Z is aryl, and that the Declaration on page 2 contains more examples where Z is a substituted aryl. The Applicants would also like to reiterate a point made earlier in the prosecution process that the experiments presented on pages 42-50 of the specification show that it is the  $-YS(O)_2X$  moiety that imparts the anti-fouling properties to the system or coating, and that compounds comprising this moiety can tolerate a wide variety of Z moieties and still be effective at preventing biofouling. For instance, see page 46, the second full paragraph, where it is reported that similar compounds lacking the sulfate ester group (e.g. cinnamic acid, ferulic acid, coumaric acid) do not show anti-fouling properties.

The Applicants respectfully submit that the scope of compounds covered in claims 1 and 39 as amended, and claims dependent thereon, is enabled by the specification and further supported by the Declaration, such that one of ordinary skill in the art would believe they possess antifouling properties and could make and use the claimed systems and coatings comprising them.

Accordingly, the Applicants respectfully request the withdrawal of the rejection of the claims under 35 U.S.C. 112¶1.

#### **Withdrawn Claims**

Claims 27, 28 and 34-37 stand withdrawn as being drawn to a non-elected species. Applicants respectfully submit that the generic claims encompassing the non-elected species are in condition for allowance and are entitled to consideration of claims 27, 28, and 34-37 which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141.

Claims 27 and 28 have been amended to properly depend upon claim 26 instead of canceled claim 25. Claims 34-37 have been amended to clarify the claims in light of the amendment to claim 1. No new matter has been added. Applicants respectfully request that if the Examiner agrees with the Applicants and allows the generic claims, that the Examiner also rejoin and consider the withdrawn claims.

**Fees**

The Applicants believe that no additional fees are due in connection with the filing of this paper. Nevertheless, the Director is hereby authorized to charge any additional required fee to our Deposit Account, **06-1448**.

### Conclusion

In view of the above amendments and remarks, the Applicants believe that the pending claims are in condition for allowance. If a telephone conversation with Applicant's Agent would expedite prosecution of the application, the Examiner is urged to contact the undersigned.

Respectfully submitted,  
Foley Hoag LLP

Foley Hoag LLP  
155 Seaport Boulevard  
Boston, MA 02210  
Telephone: (617) 832-1000  
Telecopier: (617) 832-7000

By: Michael J. DiVerdi  
Michael J. DiVerdi, PhD  
Reg. No. 51,620  
Agent for Applicants

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